

**DETECTION AND DISCRIMINATION OF  
INSTABILITIES IN PROCESS CONTROL LOOPS**

**ABSTRACT**

5 A method and apparatus determines the presence of and source of instabilities,  
such as limit cycles, within a process control loop while the process control loop  
operates on-line within a process environment. The method and apparatus measures  
one or more signals within a process control loop when the process control loop is  
connected on-line within a process control environment, stores the measured signal as  
signal data and then performs one or more statistical analyses on the stored signal data  
10 to determine whether instabilities exist and, if so, whether the source of an instability  
is within a servo loop or outside of a servo loop and is due to friction, external forces  
or mechanical anomalies.